United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

Pesticide Management
Pest management can impact water quality and air quality through the offsite movement of pesticides. Pesticides can move away from the site of application via surface runoff, leaching, drift, and volatilization. Pesticide residues in drinking water can be a hazard to humans. Pesticide residues in surface water can negatively impact aquatic life. Pesticide drift can impact non-target vegetation and other sensitive receptors, including wildlife. Pesticides can also volatilize to form other air pollutants, including ozone precursors and fine particulate matter.

Benefits
These activities will result in substantial improvements in both water and air quality by reducing off-site pesticide movement through leaching, solution runoff, adsorbed runoff, airborne drift and volatilization.

Criteria for Pesticide Management Enhancement Activity
Implementation of this enhancement requires a participant to apply and/or maintain a high level Integrated Pest Management (IPM) system (Choice A) **or** 2 or more pesticide risk mitigation activities applicable to all enterprises (Choice B and 2 selections of 1-7))

A. **Utilize a High Level Integrated Pest Management System with Pesticides Applied only as a Last Resort for Managing Pests and for Reducing Environmental Risk**. A high level IPM system must go beyond basic pest management by including pest prevention and avoidance mitigation techniques, and only utilizing pest suppression techniques when pest monitoring indicates that an economic pest threshold has been exceeded. Mitigation techniques include both IPM management techniques and Conservation Practices. Appropriate mitigation is selected based on environmental risk evaluation with tools like the Revised Universal Soil Loss Equation 2 (RUSLE 2) for evaluating the use of tillage for weed control, and the NRCS Windows Pesticide Screening Tool (WIN-PST) for evaluating the use of pesticides. Cultural and biological control techniques as well as lower risk pesticides and lower risk pesticide application techniques are used when they are efficacious and cost effective.

B. **Use Two or More Pesticide Risk Mitigation Activities**--The two activities must be in addition to activities documented in the Soil and Water Eligibility Tool.

1. Use precision pesticide application technology to reduce spray drift and the total amount of pesticide applied. This can include:

Air & Water Quality Enhancement Activity – Pesticide Management

a. Precision guidance systems that reduce ground or aerial spray overlap to less than 12 inches [e.g., Global Positioning Systems (GPS) and Real Time Kinetics (RTK)]

b. Variable rate technologies (VRT) that allow the rate of pesticide application to dynamically change for site specific conditions as determined by the operator, maps or sensors [this may include remote sensing and/or precision guidance]

c. "Smart sprayers" that utilize automatic sensors and computer controlled nozzles to turn individual nozzles on and off as appropriate to target weeds or foliage

d. Computer guided application systems that integrate real time meteorological data and computer model guidance to reduce pesticide drift from aerial application [e.g., AIMMS , Wingman™GX, and NextStar™ Flow Control]

2. Use GPS data loggers that document site-specific compliance with all label requirements for drift mitigation

3. Increase spray droplet size near edge of field to reduce offsite drift (can be accomplished in fixed wing aerial applications by reducing airspeed)

4. Use re-circulating spray technologies that capture and reuse overspray

5. Use low-drift nozzles and/or lower pressure on pesticide application equipment

6. Use chemical adjuvants proven to reduce pesticide drift

7. Maintain windbreaks where pesticides are applied to reduce and/or intercept spray drift

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United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

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United States Department of Agriculture
Natural Resources Conservation Service

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United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

Worksheet 01: Utilize a high level Integrated Pest Management system with pesticides applied only as a last resort for managing pests and for reducing environmental risk

IPM is a sustainable approach to pest control that combines the use of prevention, avoidance, monitoring and suppression strategies, to maintain pest populations below economically damaging levels, to minimize pest resistance, and to minimize harmful effects of pest control on human health and environmental resources. IPM suppression systems include biological controls, cultural controls and the judicious use of chemical controls.

A high level IPM system must go beyond basic pest management by including pest prevention and avoidance mitigation techniques, and only utilizing pest suppression techniques when pest monitoring indicates that an economic pest threshold has been exceeded. Mitigation techniques include both IPM management techniques and Conservation Practices. Appropriate mitigation is selected based on environmental risk evaluation with tools like the Revised Universal Soil Loss Equation 2 (RUSLE 2) for evaluating the use of tillage for weed control, and the NRCS Windows Pesticide Screening Tool (WIN-PST) for evaluating the use of pesticides. Cultural and biological control techniques as well as lower risk pesticides and lower risk pesticide application techniques are used when they are efficacious and cost effective.

Required Elements:

- Attach copies of the IPM systems used on your operation/enterprise. The systems should cover all of the offered acres where pest management is used. Each system should describe the resource concern(s), target pest(s), pest management alternatives, environmental risk analysis using the appropriate tools (RUSLE2, WIN-PST, etc) and the mitigation required to reduce the risk to acceptable levels.

- Briefly describe how the IPM systems used on your operation/enterprise have reduced pesticide related water and air quality resource concerns.

United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

- Worksheet 02: Use precision pesticide application technology to reduce spray drift and the total amount of pesticide applied

Precision pesticide application technology can include any of the following:

- Precision guidance systems that reduce ground or aerial spray overlap to less than 12 inches [e.g., Global Positioning Systems (GPS) and Real Time Kinetics (RTK)]
- Variable rate technologies (VRT) that allow the rate of pesticide application to dynamically change for site specific conditions as determined by the operator, maps or sensors (this may include remote sensing and/or precision guidance)
- "Smart sprayers" that utilize automatic sensors and computer controlled nozzles to turn individual nozzles on and off as appropriate to target weeds or foliage
- Computer guided application systems that integrate real time meteorological data and computer model guidance to reduce pesticide drift from aerial application (e.g., AIMMS , Wingman™GX, and NextStar™ Flow Control)

Required Elements:

- Describe in detail the kind or precision pesticide application technology used on the offered acres, how it operated to reduce spray drift, and the total amount of pesticide applied

United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

- Worksheet 03: Use GPS data loggers that document site-specific compliance with all label requirements for drift mitigation

GPS data loggers can be used to precisely document where pesticides are applied thereby confirming compliance with product label requirements, such as setbacks from sensitive areas, and pesticides being applied in solution.

Required Elements:

- Provide copies of product labels for each pesticide used on the offered acres and clearly identify any requirements for drift reduction on each label

- Describe the data logger used on the offered acres and how the logger was used to meet product label requirements for drift reduction

- Provide the data logger output from the offered acres

United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

- Worksheet 04: Increase spray droplet size near edge of field to reduce offsite drift

Increasing spray droplet size near the field edge can help reduce drift from the field to nearby locations. Examples of how droplet size can be increased include decreasing sprayer pressure and, in fixed wing aerial applications, by reducing airspeed.

Required Elements:

- Describe how you have increased droplet size near the edge of your fields to reduce offsite drift of pesticides from the offered acres

United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

- Worksheet 05: Use re-circulating spray technologies that capture and reuse overspray

The use of re-circulating spray technologies include elements that capture overspray and cycle it back to a central distribution tank for re-use. These technologies reduce the total amount of agro-chemicals distributed on working lands.

Required Elements:

- Describe the re-circulating spray technology you use on offered acres to capture and re-use overspray and provide documentation of how, when, and where used

United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

- Worksheet 06: Use low-drift nozzles and/or lower pressure on pesticide application equipment

Low drift nozzles and/or lower pressure on application equipment will produce larger droplets that are less likely to drift away from the intended target. A spray with larger droplet sizes will also provide an overall volume with smaller total droplet surface area, thus decreasing the potential for evaporation from the droplets and minimizing the potential for drift and volatilization.

Required Elements:

- Describe the method you used on the offered acres to increase droplet size
- Provide copies of receipts documenting the purchase of low-drift nozzles, if applicable

United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

- Worksheet 07: Use chemical adjuvants proven to reduce pesticide drift

A pesticide adjuvant is broadly defined as any substance added to the spray tank, separate from the pesticide formulation, to improve the performance of the pesticide. As small droplets can travel farther than larger droplets, some chemical adjuvants function as drift retardants by increasing mean droplet size. Adjuvants can include everything from wetting agents to feeding stimulants. When used properly, they can be very effective at reducing the amount of pesticide required and the amount of spray drift.

Required Elements:

- Provide a list of pesticide products that you use and the adjuvants used with each product to reduce drift

- Provide adjuvant receipts or other documentation substantiating both purchase and use

United States Department of Agriculture
Natural Resources Conservation Service

Air & Water Quality Enhancement Activity – Pesticide Management

- Worksheet 08: Maintain windbreaks where pesticides are applied to reduce and/or intercept spray drift

Shrub and/or tree windbreaks can reduce movement of applied pesticides by reducing wind speeds within the field and by intercepting pesticides in the air stream as air passes through the windbreaks. Windbreaks can also help mix the drifting compounds vertically in the air by disrupting airflows at the field edge thereby reducing the pesticide concentration in the air.

Any producer using this enhancement activity shall adhere to the relevant air quality design criteria put forth in Conservation Practice Standard 380, Windbreak/Shelterbelt Establishment.

Required Elements:

- Provide a map showing the locations of windbreaks on the offered acres. Include the general direction of the wind during pesticide applications. Also provide drawings of cross sections of your windbreaks showing the shrub and/or tree species, in-row spacing of the shrubs and/or trees, the general heights of species in each row, and distances between the rows if the windbreak is multi-row